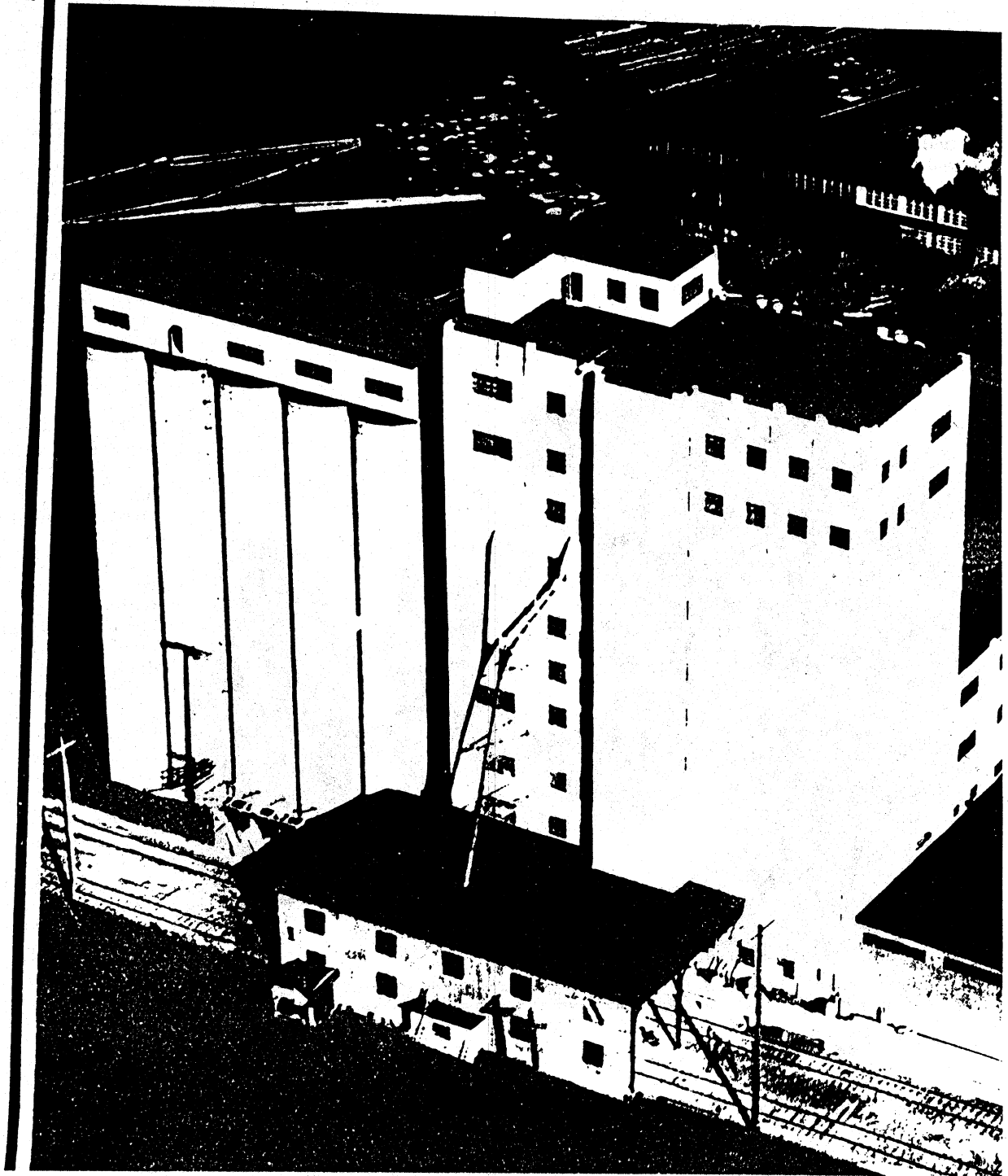


NEWS

for
Farmer
Cooperatives

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Bristles Outlet for Casein

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IT'S a far piece from a pasture to paint brushes, filler for upholstered furniture, air filters for carburetors, and even the stiff cloth used in an admiral's or general's cap. But with the help of the dairy cow and Department of Agriculture research men, the gap has been closed.

For research recently has opened up another possible use for one of the by-products from dairy cooperatives—a fiber of many uses made from casein. Of course, casein produced from the skim milk left over in manufacturing butter isn't the only use made of skim milk. Much of it is also used in increasing quantities for food, and a good bit of it goes into commercial outlets as a raw material for producing dried whey or milk sugar. Actually 100 pounds of skim milk yields 3 pounds of casein and 7 pounds of dried whey or 4 pounds of milk sugar.

However, the supply of casein often exceeds the demand. So during the last 10 years the Department of Agriculture

has worked intensively to perfect a casein fiber with the properties of animal hairs such as wool, horsehair, and bristles, and develop uses for it. The Eastern Regional Research Laboratory of the Agricultural Research Administration at Philadelphia has now announced the successful manufacture of a large diameter fiber that is ready for commercial exploitation.

Small Co-ops Need Casein Outlet

This should interest dairy cooperatives, particularly the smaller associations. Up until now they often have found it impossible to produce casein byproducts profitably because the price takes sudden dips and swings from year to year. For that reason casein production varies considerably from one year to the next. For example, in 1947, 36 million pounds were produced whereas in 1948 production amounted to only 15 million pounds. During recent years the price has averaged about 30 cents a pound, although it recently dropped to 22 cents.

Casein's most important industrial uses are for adhesive, paper coating, in paints, and in making plastics. Now successful production of a large diameter fiber that

is durable and useful gives still another potential outlet.

Casein bristle is flexible and durable and can be produced in any desired diameter, length or color, making possible a wide variation in its properties and uses. It is about three-fourths as strong as hair. Although the suggested uses for casein bristles are largely as substitutes for natural animal hair, because of the unique properties of this material it will probably be used mostly in new products rather than as a substitute. The bristle and articles made with it are illustrated in the accompanying picture.

Paint brushes made with casein bristle can be used with oil-base paints, but are unsatisfactory for water paints because the bristle softens in water. The bristle can be coiled easily, forming resilient coils. Thus, it is a useful material for upholstered furniture. It has a particular advantage in this field in that it can be made insect proof. A unique use for this material is in the construction of air filters for carburetors. Another promising use is for making stiff cloth used in the lapels of men's coats, in uniform caps, and similar articles in the clothing industry.

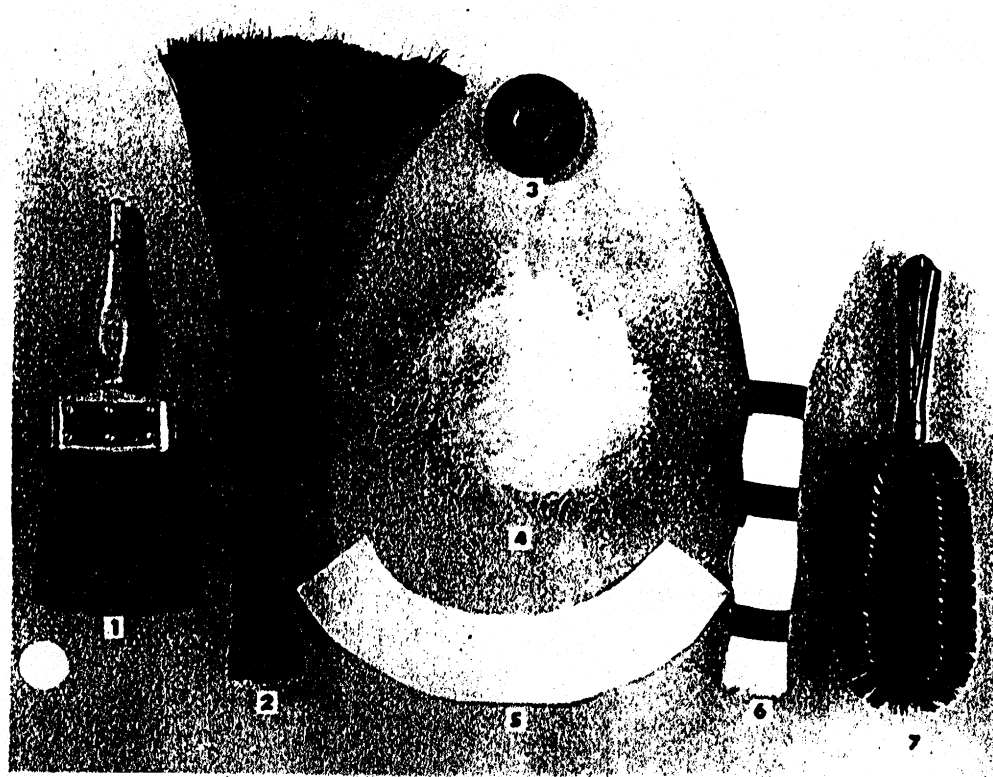
Approximate Costs Given

The cost of converting casein into bristle can be given only approximately. Estimates, which vary with daily production, indicate that casein bristles can be produced for 35 to 50 cents a pound at the current price of casein. At present, processed horsehair and pig bristles sell for several dollars a pound, and are difficult to buy since they are obtained principally from the Orient. It is thus apparent that there is a good price margin between casein bristles and natural hair.

The method for making casein bristle fiber is simple and should not require a large amount of capital for equipment or operation.

Casein is converted into fiber by an extruder. The extruder consists of a screw which forces the casein-water mixture, heated to 195-210° F., through a die with many small openings about 0.01 inch in diameter. The fiber is drawn through two tanning baths. The first bath contains bentonite to prevent sticking, as well as formaldehyde; the second contains only formaldehyde. The wet fiber is collected on a large reel and allowed to air-dry on the reel in a well-ventilated room. This method of drying makes it necessary to have a number of reels for each extruder.

That's the technical process developed at the Research Laboratory to produce casein fiber. It can provide another outlet for byproducts of cooperatives that manufacture dairy products if commercial sources begin to actively use it in manufacturing any of the articles the laboratory has been successful in making with it.



the route developed by the U. S. Department of Agriculture Eastern Regional Research Laboratory, Philadelphia, milk is converted into casein, then into casein fiber which makes these items.